

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 48 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 48 recites the limitation "the adjacent heat exchanger plate" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 25-26,32,33,39,40,41,44,45,46,47 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuoka Tomoichi (JP 2001-280888). Matsuoka discloses (figures 2-3) a plate heat exchanger comprising a plate package, the plate package including a number of first heat exchanger plates and a number of second heat exchanger plates; the plates (1) being permanent joined to each other (brazing) and arranged beside each other so that a first plate interspace (5) is formed between each pair of adjacent first and second heat exchanger plate, and so that a second plate interspace (6) is formed between each pair of adjacent second heat exchanger plates and first exchanger plates, wherein the first plate interspaces (5) and the second

interspaces (6) are separated from each other and provided beside each other in alternating order in the plate package; wherein substantially each heat exchanger plate has at least a first porthole and a second port (2,3), the first port holes forming a first inlet channel to the first plate interspaces and the second portholes forming a first outlet channel from the first plate interspaces; wherein the plate package includes a separate space (23) for each of the first plate interspaces, which space is closed to the second plate interspaces; wherein the separate space (23) communicates with the first inlet channel via an inlet nozzle (22), which forms a throttling with significantly reduced flow area, and with the respective first plate interspace via an outlet nozzle (24), which forms a throttling with significantly reduced flow area; the separate space (23) is provided in the proximity of the inlet channel; each of the heat exchanger plates (1) includes a central extension plane, an upper plate plane on one side of the central extension and a lower plate plane on the other side of the central extension plane; each of the second heat exchanger plates includes an upper surface area, which extends around the first porthole and which delimits the separate space, and the upper surface area is located at the level of the upper plate plane; the upper surface area of the second heat exchanger plates is located partly opposite to the lower surface area of the first plates for forming the separate space between these surface areas; the inlet nozzle (22) is located opposite to the lower surface area of the first heat exchanger plates (inlet nozzle located above the lower surface area); the outlet nozzle (24), with regard to the central extension plane, is displaced in relation to the lower surface area of the first heat exchanger plates (the outlet nozzle (24) is not located on the lower surface area of the first heat exchanger plate); the first plate and second plate interspaces form first and second fluid passages for two different fluids (P, Q); each of the heat exchanger plate further has a third and

forth port holes (figure 7); the separate space (23) is delimited by at least one ring (21), which extends around the inlet channel and each of the rings is provided in a ring groove in the adjacent heat exchanger plate.

Claims 25-26,28-36 and 38-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderson et al. (US 5,924,484). Anderson discloses (figures 1 and 3) a plate heat exchanger comprising a plate package, the plate package including a number of first heat exchanger plates and a number of second heat exchanger plates; the plates (2) being permanent joined to each other and arranged beside each other so that a first plate interspace (13) is formed between each pair of adjacent first and second heat exchanger plate, and so that a second plate interspace (shown as outside of 13) is formed between each pair of adjacent second heat exchanger plates and first exchanger plates, wherein the first plate interspaces (13) and the second interspaces are separated from each other and provided beside each other in alternating order in the plate package; wherein substantially each heat exchanger plate has at least a first porthole and a second port (9), the first port holes forming a first inlet channel (11) to the first plate interspaces and the second portholes forming a first outlet channel from the first plate interspaces; wherein the plate package includes a separate space (15) for each of the first plate interspaces, which space is closed to the second plate interspaces; wherein the separate space (15) communicates with the first inlet channel via an inlet nozzle (shown in figure A as gap between portion 16), which forms a throttling with significantly reduced flow area (compare with port (9)), and with the respective first plate interspace via an outlet nozzle (18), which forms a throttling with significantly reduced flow area; the separate space (15) is provided in the proximity of the inlet channel. Regarding claims 28 and 30,32-34, each of the second heat exchanger plates (2); each

of the heat exchanger plates (2) includes a central extension plane, an upper plate plane on one side of the central extension and a lower plate plane on the other side of the central extension plane; each of the second heat exchanger plates includes an upper surface area, which extends around the first porthole and which delimits the separate space, and the upper surface area is located at the level of the upper plate plane; the upper surface area of the second heat exchanger plates is located partly opposite to the lower surface area of the first plates for forming the separate space between these surface areas, the outlet nozzle is formed by a respective hole, which extends through the upper surface area; the heat exchanger includes an end plate, which is provided adjacent to one of the second heat exchanger plates and closes the hole of the outlet nozzle of the second heat exchanger plate (figure 3). Regarding claim 36, Anderson discloses (figure A) each of the second heat exchanger plate includes a lower surface area, which extends around the first port hole (9) between the first port hole and the upper surface area, wherein the lower surface area is located at the level of the lower plate plane. Regarding claims 38,42-43, Anderson further disclose (figure A) that each of the first heat exchanger plate includes a lower surface area, which extends around the first porthole (9) and which delimit the separate space, wherein the upper surface area of the second heat exchanger plate is located partly opposite to the lower surface area of the first heat exchanger plates for forming the separated space (15) between these surface areas; the lower surface area of the second heat exchanger is located partly opposite to the upper surface of the first heat exchanger plate, wherein these two surface areas partly abut each other in the plate package. Anderson further discloses (figures 1-2 and column 3, lines 1-4) the first plate and second plate interspaces form first and second fluid passages for

two different fluids and each of the heat exchanger plate further has a third and forth port holes (figure 1).

Regarding claims 29,31, 39,40 and 41, another interpretation of the separate space is shown in figure B, wherein the inlet nozzle is located opposite to the lower surface area of the first heat exchanger plates (inlet nozzle located above the lower surface area); the outlet nozzle (18), with regard to the central extension plane, is displaced in relation to the lower surface area of the first heat exchanger plates (the outlet nozzle (18) is not located on the lower surface area of the first heat exchanger plate); the first plate and second plate interspaces form first and second fluid passages for two different fluids; each of the heat exchanger plate further has a third and forth port holes (figure 1).

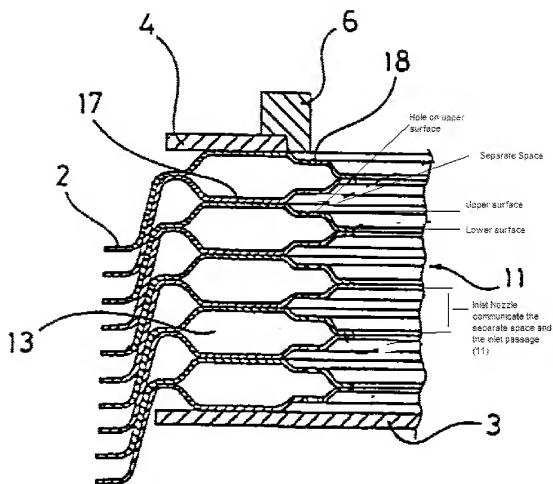


Figure A: the modified figure corresponds to figure 3 with limitation of second plate shown.

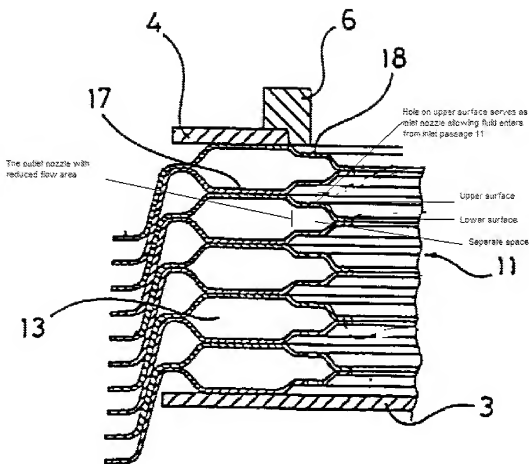


Figure B: the modified figure corresponds to figure 3 with limitation of second plate shown

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 27 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Matsuoka or Anderson. Matsuoka and Anderson substantially

discloses all of applicant's claimed invention as discussed above except for the limitation that the separate space has been produced through compression molding of the heat exchanger plates. The method of forming the device is not germane to the issue of the patentability of the device itself. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). In this case, the separated space of the prior art of Matsuoka or Anderson is the same of the separated space as claimed, the claim is unpatentable even though the prior product was made by a different process.

Allowable Subject Matter

Claim 37 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gleisle et al. (US 2001/0030043A1) discloses a brazed plate heat exchanger.

Fischer (US 4,660,633) discloses a plate heat exchanger.

H. H. Ehrman (US 2,550,339) discloses a plate type heat exchanger.

P.E.R. Stalberg (US 3,444,926) discloses an arrangement in heat exchangers of the plate type.

G. Jendrassik (US 2,617,634) discloses a heat exchanger.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tho v. Duong whose telephone number is 571-272-4793. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tyler J. Cheryl can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tho v Duong/
Primary Examiner, Art Unit 3744